

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

Before computing the patent application fee, please cancel claims 1-28, and add the following new claims 29-61 to the application.

**Listing of Claims:**

- 1           29. **(new)** A method of implementing a user interface comprising:
  - 2           storing one or more description documents defining a plurality of
  - 3           types of at least one user interface and comprising definitions of elements
  - 4           of the at least one user interface;
  - 5           storing a plurality of objects each comprising a renderer for
  - 6           rendering a different one of the elements;
  - 7           forming a first renderer of a selected user interface of a selected
  - 8           any one type of the plurality of the types by loading into an interface-
  - 9           implementation engine (interactor) objects of the plurality of objects that
  - 10          correspond to the elements of at least one description document of the
  - 11          stored description documents that defines the selected user interface of
  - 12          the selected any one type;
  - 13          rendering the selected user interface of the selected any one type
  - 14          by executing the first renderer;
  - 15          forming a second renderer of a selected user interface of a selected
  - 16          any other type of the plurality of the types which is different from said any
  - 17          one type by loading into same said interactor objects of the plurality of
  - 18          objects that correspond to the elements of at least one description
  - 19          document of the stored description documents that defines the selected
  - 20          user interface of the selected any other type; and
  - 21          rendering the selected user interface of the selected any other type
  - 22          by executing the second renderer.

1           30. **(new)** The method of claim 29 wherein:  
2           the one type of interface is a telephony user interface (TUI); and  
3           the other type of interface is a graphical user interface (GUI).

1           31. **(new)** The method of claim 29 wherein:  
2           each step of forming comprises  
3           reflecting the definitions of the elements from the at least one  
4           description document that defines the selected user interface of the  
5           selected type into an object model to create an instance of the object  
6           model that defines the selected user interface of the selected type; and  
7           each step of rendering comprises  
8           executing the objects that correspond to the reflected element  
9           definitions.

1           32. **(new)** The method of claim 29 wherein:  
2           each step of rendering comprises  
3           passing each element definition from the at least one description  
4           document that defines the selected user interface of the selected type to  
5           the corresponding object and executing said object to render the element.

1           33. **(new)** The method of claim 29 wherein:  
2           storing one or more description documents comprises  
3           storing one or more description documents defining the at least one  
4           user interface and comprising one or more definition elements, and  
5           storing one or more description documents defining interactions of  
6           the at least one user interface with at least one application and comprising  
7           one or more interaction elements;  
8           storing a plurality of objects comprises  
9           storing a plurality of layout objects each comprising a renderer for  
10          rendering a different one of the definition elements, and

11 storing a plurality of connector objects each comprising a renderer  
12 for rendering a different one of the interaction elements;  
13 each step of forming a renderer comprises  
14 forming a layout engine for the selected user interface from layout  
15 objects that correspond to the definition elements of at least one  
16 description document that defines the selected user interface, and  
17 forming a connector engine for the selected user interface from  
18 layout objects that correspond to the interaction elements of at least one  
19 description document that defines interaction of the selected user interface  
20 with a selected application; and  
21 each step of rendering the selected user interface comprises  
22 rendering the selected interface to the selected application by  
23 executing the layout engine and the connector engine.

1 34. **(new)** The method of claim 33 wherein:  
2 rendering the selected interface to the selected application by  
3 executing the layout engine and the connector engine comprises  
4 passing each element of the description documents that define the  
5 selected user interface and its interaction with the selected application to  
6 the corresponding object and executing said object to render said  
7 element.

1 35. **(new)** An apparatus that effects the method of one of the  
2 claims 29-34.

1 36. **(new)** A computer-readable medium containing instructions  
2 which, when executed in a computer, cause the computer to perform the  
3 method of one of the claims 29-34.

1 37. **(new)** An apparatus for implementing a user interface,  
2 comprising:

3 storage for storing (a) one or more description documents defining  
4 a plurality of types of at least one user interface and comprising definitions  
5 of elements of at least one user interface, and (b) a plurality of objects  
6 each comprising a renderer for rendering a different one of the elements;  
7 and  
8 a processor for connecting to the storage and (c) forming a first  
9 renderer of a selected user interface of a selected any one type of the  
10 plurality of the types by loading into an interface implementation engine  
11 (interactor) objects of the plurality of objects that correspond to the  
12 elements of at least one description document of the stored description  
13 documents that defines the selected user interface of the selected any one  
14 type, (d) rendering the selected user interface of the selected any one type  
15 by executing the renderer, (e) forming a second renderer of a selected  
16 user interface of a selected any other type of the plurality of the types  
17 which is different from said any one type by loading into same said  
18 interactor objects of the plurality of objects that correspond to the  
19 elements of at least one description document of the stored description  
20 documents that defines the selected user interface of the selected any  
21 other type, and (f) rendering the selected user interface of the selected  
22 any other type by executing the second renderer.

1 38. **(new)** The apparatus of claim 37 wherein:

2 the processor renders the selected user interface of the selected  
3 type by passing each element definition from the at least one description  
4 document that defines the selected user interface of the selected type to  
5 the corresponding object and executes said object to render the element.

1 39. **(new)** The apparatus of claim 37 wherein:

2 the one type of interface is a telephony user interface (TUI); and  
3 the other type of interface is a graphical user interface (GUI).

1           40. **(new)** The apparatus of claim 37 wherein:  
2           the processor forms each renderer by reflecting the definitions of  
3           the elements from the at least one description document that defines the  
4           selected user interface of the selected type into an object model to create  
5           an instance of the object model that defines the selected user interface of  
6           the selected type; and  
7           the processor renders each selected user interface by executing  
8           the objects that correspond to the reflected element definitions.

1           41. **(new)** The apparatus of claim 37 wherein:  
2           the storage stores (a)(i) one or more description documents  
3           defining at least one user interface and comprising one or more definition  
4           elements, (a)(ii) one or more description documents defining interactions  
5           of the at least one user interface with at least one application and  
6           comprising one or more interaction elements, (b)(i) a plurality of layout  
7           objects each comprising a renderer for rendering a different one of the  
8           definition elements, and (b)(ii) a plurality of connector objects each  
9           comprising a renderer for rendering a different one of the interaction  
10          elements; and  
11          the processor forms (c)(i) a layout engine for the selected user  
12          interface of the selected type from layout objects that correspond to the  
13          definition elements of at least one description document that defines the  
14          selected user interface of the selected type and (c)(ii) a connector engine  
15          for the selected user interface of the selected type from layout objects that  
16          correspond to the interaction elements of at least one description  
17          document that defines interaction of the selected user interface of the  
18          selected type with a selected application, and (d) renders the selected  
19          interface of the selected type to the selected application by executing the  
20          layout engine and the connector engine.

1           42. **(new)** The apparatus of claim 41 wherein:  
2           the processor renders the selected user interface of the selected  
3 type to the selected application by passing each element of the description  
4 documents that define the selected user interface of the selected type and  
5 its interactions with the selected application to the corresponding object  
6 and executing said object to render said element.

1           43. **(new)** An apparatus for implementing a user interface  
2 comprising:  
3           means for storing one or more description documents defining a  
4 plurality of types of at least one user interface and comprising definitions  
5 of elements of the at least one user interface;  
6           means for storing a plurality of objects each comprising a renderer  
7 for rendering a different one of the elements;  
8           means for forming a first renderer of a selected user interface of a  
9 selected any one type of the plurality of the types by loading into an  
10 interface-implementation engine (interactor) objects of the plurality of  
11 objects that correspond to the elements of at least one description  
12 document of the stored description documents that defines the selected  
13 user interface of the selected any one type;  
14           means for rendering the selected user interface of the selected any  
15 one type by executing the first renderer;  
16           means for forming a second renderer of a selected user interface of  
17 a selected any other type of the plurality of the types which is different  
18 from said any one type by loading into same said interactor objects of the  
19 plurality of objects that correspond to the elements of at least one  
20 description document of the stored description documents that defines the  
21 selected user interface of the selected any other type, and  
22           means for rendering the selected user interface of the selected any  
23 other type by executing the second renderer.

1           44. **(new)** The apparatus of claim 43 wherein:  
2           the one type of interface is a telephony user interface (TUI); and  
3           the other type of interface is a graphical user interface (GUI).

1           45. **(new)** The apparatus of claim 43 wherein:  
2           each means for forming comprises means for reflecting the  
3           definitions of the elements from the at least one description document that  
4           defines the selected user interface of the selected type into an object  
5           model to create an instance of the object model that defines the selected  
6           user interface of the selected type; and  
7           each means for rendering comprises means for executing the  
8           objects that correspond to the reflected element definitions.

1           46. **(new)** The apparatus of claim 43 wherein:  
2           means for rendering comprise  
3           means for passing each element definition from the at least one  
4           description document that defines the selected user interface to the  
5           corresponding object; and  
6           means for executing said object to render the element.

1           47. **(new)** A method comprising:  
2           storing description documents that define a user interface,  
3           comprised of interface elements, in terms of an object model, some of the  
4           description documents defining a first type of the user interface and others  
5           of the description documents defining a second type of the user interface;  
6           storing renderers each for rendering a different one of the interface  
7           elements, some of the renderers for rendering the first type of the user  
8           interface and others of the renderers for rendering the second type of the  
9           user interface;

10 parsing the description documents of a selected either type of the  
11 user interface by an interface implementation engine (interactor) to identify  
12 the elements of the selected type of user interface;  
13 reflecting the identified elements into the object model by the  
14 interactor to generate an instance of the object model that represents the  
15 selected type of the user interface;  
16 downloading the renderers corresponding to the reflected elements  
17 into the interactor to create a renderer for the selected type of the user  
18 interface; and  
19 executing the renderer by the interactor to create the selected type  
20 of the user interface.

1 48. (new) The method of claim 47 wherein:  
2 the first type of the interface is a telephony user interface (TUI); and  
3 the second type of the interface is a graphical user interface (GUI).

1 49. (new) The method of claim 47 wherein:  
2 the description documents are expressed in a mark-up language.

1 50. (new) The method of claim 47 wherein:  
2 the description documents define the object model.

1 51. (new) The method of claim 47 wherein:  
2 each renderer is an object whose execution renders the  
3 corresponding interface element.

1 52. (new) The method of claim 51 wherein:  
2 executing the renderer comprises  
3 invoking execution of each loaded renderer with the corresponding  
4 reflected element of the object model to render the corresponding  
5 interface element.

1           53. (new) The method of claim 47 wherein:  
2           each renderer is for rendering the different interface element in a  
3           different interface of a different type for a different device and a different  
4           application.

1           54. (new) An arrangement comprising:  
2           description documents that define a user interface, comprised of  
3           interface elements, in the terms of an object model, some of the  
4           description documents defining a first type of the user interface and others  
5           of the description documents defining a second type of the user interface;  
6           renderers each for rendering a different one of the interface  
7           elements, some of the renderers for rendering the first type of the user  
8           interface and others of the renderers for rendering the second type of the  
9           user interface; and  
10          an interface implementation engine (interactor) for parsing the  
11          description documents of a selected either type of the user interface to  
12          identify the elements of the selected type of user interface, for reflecting  
13          the identified elements into the object model to generate an instance of  
14          the object model that represents the selected type of the user interface, for  
15          loading the renderers corresponding to the reflected elements into the  
16          interactor to create a renderer of the selected type of the user interface,  
17          and for executing the renderer to create the selected type of the user  
18          interface.

1           55. (new) The arrangement of claim 54 wherein:  
2           the first type of the interface is a telephony user interface (TUI); and  
3           the second type of the interface is a graphical user interface (GUI).

1           56. (new) The arrangement of claim 54 wherein:  
2           the description documents are expressed in a mark-up language.

1           57. (new) The arrangement of claim 54 wherein:  
2           the description documents define the object model.

1           58. (new) The arrangement of claim 54 wherein:  
2           each renderer is an object whose execution renders the  
3           corresponding interface element.

1           59. (new) The arrangement of claim 58 wherein:  
2           the interactor executes the renderer by invoking execution of each  
3           loaded renderer with the corresponding reflected element of the object  
4           model to render the corresponding interface element.

1           60. (new) The arrangement of claim 54 wherein:  
2           each renderer is for rendering the different interface element in a  
3           different interface of a different type for a different device and a different  
4           application.

1           61. (new) The arrangement of claim 54 further comprising:  
2           storage for the description documents;  
3           storage for the renderers; and  
4           a processor for forming the interactor.